

THE INVENTION CLAIMED IS:

1. A method of manufacturing a spiral inductor comprising:
providing a substrate;
forming an inductor dielectric layer over the substrate;
5 forming a spiral opening in the inductor dielectric layer;
forming a spiral inductor in the spiral opening, the spiral inductor including; and
forming a plurality of parallel spiral vias connected together at center proximate and
center distal ends of the spiral inductor.
2. The method as claimed in claim 1 wherein:
10 forming the spiral inductor includes:
forming a spiral line in the spiral opening; and
forming the plurality of parallel spiral vias above the spiral line and integral
therewith.
3. The method as claimed in claim 1 wherein:
15 forming the spiral inductor includes:
forming a spiral line over the plurality of parallel spiral vias and integral
therewith.
4. The method as claimed in claim 1 including:
forming a first connecting portion;
20 forming connecting via between the first connecting portion and the center proximate
end of the spiral inductor; and
forming a second connecting portion connected to the center distal end of the spiral
inductor.
5. The method as claimed in claim 1 wherein:
25 forming the spiral opening forms a multi-turn spiral from a group consisting of
square, rectangular, and circular spirals.
6. A method of manufacturing a spiral inductor comprising:
providing a substrate;
forming a field dielectric layer over the substrate;
30 forming an inductor dielectric layer over the field dielectric layer;
forming a spiral opening in the inductor dielectric layer;
forming a spiral inductor in the spiral opening, the spiral inductor including;

forming a plurality of parallel spiral vias connected together at center proximate and center distal ends of the spiral inductor;
forming a first connecting portion connected to the center proximate end of the spiral inductor; and
5 forming a second connecting portion connected to the center distal end of the spiral inductor.

7. The method as claimed in claim 6 wherein:
forming the spiral inductor includes:

10 forming a spiral line in the spiral opening connected together to the parallel spiral vias at the center proximate and the center distal ends of the spiral inductor; and
forming the plurality of parallel spiral vias above the spiral line and integral therewith.

15 8. The method as claimed in claim 6 wherein:
forming the spiral inductor includes:
forming a spiral line over the plurality of parallel spiral vias and integral therewith, the spiral line connected together to the parallel spiral vias at the center proximate and the center distal ends of the spiral inductor.

20 9. The method as claimed in claim 6 including:
forming a connecting portion dielectric over the field dielectric and under the inductor dielectric layer;
forming an opening in the connecting portion for the first connecting portion;
forming connecting via between the first connecting portion and the center proximate end of the spiral inductor; and
25 forming a second connecting portion connected to the center distal end of the spiral inductor.

10. The method as claimed in claim 6 wherein:
forming the spiral opening forms a multi-turn spiral from a group consisting of square, rectangular, and circular spirals.

30 11. A spiral inductor comprising:
a substrate;

an inductor dielectric layer over the substrate having a spiral opening provided therein; and

a spiral inductor in the spiral opening, the spiral inductor including;

a plurality of parallel spiral vias connected together at center proximate and center distal ends of the spiral inductor.

12. The spiral inductor as claimed in claim 11 wherein:

the spiral inductor includes:

a spiral line in the spiral opening; and

the plurality of parallel spiral vias above the spiral line and integral therewith.

13. The spiral inductor as claimed in claim 11 wherein:

the spiral inductor includes:

a spiral line over the plurality of parallel spiral vias and integral therewith.

14. The spiral inductor as claimed in claim 11 including:

a first connecting portion;

connecting via between the first connecting portion and the center proximate end of the spiral inductor; and

a second connecting portion connected to the center distal end of the spiral inductor.

15. The spiral inductor as claimed in claim 11 wherein:

the spiral opening forms a multi-turn spiral from a group consisting of square, rectangular, and circular spirals.

16. A spiral inductor comprising:

a substrate;

a field dielectric layer over the substrate;

an inductor dielectric layer over the field dielectric layer having a spiral opening provided therein;

a spiral inductor in the spiral opening, the spiral inductor including;

a plurality of parallel spiral vias connected together at center proximate and center distal ends of the spiral inductor;

a first connecting portion connected to the center proximate end of the spiral inductor;

and

a second connecting portion connected to the center distal end of the spiral inductor.

17. The spiral inductor as claimed in claim 16 wherein:

the spiral inductor includes:

a spiral line in the spiral opening connected together to the parallel spiral vias
at the center proximate and the center distal ends of the spiral inductor;

and

the plurality of parallel spiral vias above the spiral line and integral therewith.

18. The spiral inductor as claimed in claim 16 wherein:

the spiral inductor includes:

a spiral line over the plurality of parallel spiral vias and integral therewith, the
spiral line connected together to the parallel spiral vias at the center
proximate and the center distal ends of the spiral inductor.

19. The spiral inductor as claimed in claim 16 including:

a connecting portion dielectric layer over the field dielectric and under the inductor
dielectric layer, the connecting portion dielectric layer having an opening
provided therein for the first connecting portion;

connecting via between the first connecting portion and the center proximate end of
the spiral inductor; and

a second connecting portion connected to the center distal end of the spiral inductor.

20. The spiral inductor as claimed in claim 16 wherein:

the spiral opening forms a multi-turn spiral from a group consisting of square,
rectangular, and circular spirals.

21. The spiral inductor as claimed in claim 16 wherein:

the spiral inductor is fabricated by an aluminum via/line process or a copper
damascene process